Tri-cel Rainwater Harvesting Systems complying with BSI Standards Code of Practice for Rainwater Harvesting Systems

BS8515:2009 was published to regulate and create consistency in quality among suppliers of rainwater harvesting systems in the following areas:

•Design • Installation • Maintenance

Tri-cel have incorporated the design, installation and maintenance factors outlined in BS8515 into the design of their Rainwater Harvesting Systems

Introduction to Rainwater Harvesting:

Rainwater Harvesting is the collecting of rainwater from a roof and using it within the home or commercial premises for non – potable water uses, such as flushing toilets, washing machines, garden irrigation etc. The standard covers systems designed to use rainwater for non-potable application. It does not cover systems supplying water for drinking, food preparation, dishwashing and personal hygiene,

Types of Rainwater Harvesting Systems

- Pumped System: Rainwater is pumped directly from the holding tank to the point of use
- Gravity System: Rainwater is fed by gravity from the holding tank to the point of use
- Combination of Pumped & Gravity: Rainwater is pumped from the holding tank to an elevated tank and then fed by gravity to the point of use

Design

Competent design is a critical aspect of rainwater harvesting. A well-designed system ensures that our clients get the most efficient system, based on their individual and site requirement. In accordance with BS8515:2009, we also employ the following factors when designing a system:

- Amount and intensity of rainfall in particular geographical locations
- Type of roof and collection surface
- Present and future applications

The complexity in design increases with the size of a building. BS8515 adopts 3 calculations when designing a system

Simplified Approach: The simplified approach is used mainly to calculate the capacity for domestic rainwater harvesting tank by calculating the roof area and average depth of rainfall. BS have issued capacity charts within the Standard. Population of the household may also be taken into consideration calculating 50 litres per person per day for a period of 18 days.

Intermediate Approach: This approach is very similar to the simplified approach using the same criteria, but generating the capacity through a formula. This formula allows us to modify the variables for different scenarios to give a more accurate calculation.

Detailed Approach: This approach should be used to calculate larger commercial and industrial systems. All variables are examined such as flow rates, peak demands, yield and demand, and filtration levels to maintain clean rainwater supply.

Efficient and Clean Water Supply:

A number of factors play a role in providing and maintaining an efficient and clean water supply:

- Drainage surface characteristics yield different amounts and quality of rainwater. A notable example is a hard roof versus a green roof. Both cleaner rainwater and a larger yield is generated from a hard roof. Syphonic drainage systems can be introduced to maximise the yield, but modification must be made to the system to tolerate higher flow rates. Roof guttering and pipe-work should be free draining to prevent stagnation and contaminated water entering the holding tank.

- Filtering the water prior to entry into the tank prevents leaves and other debris blocking up the system and contaminating the water. To comply with BS8515, the filter supplied with the Tricel Rainwater Harvesting tank has a filter efficiency of 90%.
- Overflows are also thought to aid in maintaining clean water. Excess water is drained from the holding tank removing any floating sediment. The overflow may be equipped with an anti vermin screen to prevent rodents entering into the tank. The overflow should equal or exceed the size of the tank inlet
- If a mains water back up supply is fitted, its control mechanism is designed to minimize the amount of water supplied to maintain un-interrupted supply. Backflow prevention is provided to prevent rainwater siphoning into the main water supply by means of a Type AA or AB Air gap (U.K Jurisdiction)
- Single or dual pumps equipped with a dry run protection may be used internally or externally. Low energy consumption, low noise level and accessibility is a necessary feature of the pump. If housing the pump internally, a minimum water level must be sustained to prevent the air, debris and other sediments being drawn in and damaging the pump. The pump must is also equipped with a non-return valve.
- A control mechanism is provided with the system to inform users if the system is not working correctly. The function of the control unit is to control the pump, activate back up water supply and to provide a volt free outlet for linking to a building management system if necessary.
- The colour of the pipe work should be green, or black or green and robust to endure the pressure of the system and large enough to deal with the flow rates. All pipe-work is labelled clearly in accordance with BS8515.

Installation:

Installation should always be carried out by qualified personnel and in accordance to manufactures guidelines. All components should be easily accessible for maintenance or replacement if necessary. Consideration must be given to site conditions, groundwater levels, proximity to trees and access routes. All procedures must be adhered to ensure that the platform is sufficient for the tank, i.e. support structures for above ground tanks and suitable platform and backfill for underground tanks. Pipe work, fittings and points of use must be clearly labelled to prevent unintentional consumption of rainwater.

The rainwater harvesting system should be tested and commissioned prior to handover. Only qualified people authorised by the manufacturer should commission the system. There should be no cross connections in accordance with BS6700 and all pipe work and fittings need to comply with BS6700:2006. Electrical wiring needs to comply with BS7671.

Maintenance:

A routine maintenance and inspection schedule is necessary to maintain and ensure the effective running of your system. A logbook is an easy reminder and guide to maintenance history. Maintenance should be carried out as per manufacturer recommendations.

Risk Assessment

Before completion of design a risk assessment should be carried out to determine if the system is safe and fit for purpose. The risk assessment should incorporate assessment of the design, installation, testing, commissioning, operation and maintenance of the system along with water quality, electrics and access. The risk assessment should follow a recognized process outline in BS31100.
Our environmental design team is available to offer assistance to our clients in completion of a risk assessment.